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On the Application of the Term Cultivar to Plants of Wild Origin (with Particular Reference to Acer Davidii)

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It is becoming increasingly evident that the application of the term cultivar to plants of wild origin raises several points which are barely covered by the International Code for the Nomenclature of Cultivated Plants and which require clarification. The following notes are written with the object of briefly discussing some of these points.

As our knowledge of the polymorphism of plants in the wild increases, so will the binomial have a wider coverage. One effect of this will be to increase the number of plants in cultivation requiring nomenclatural recognition. Such plants will be of two types: some will be in cultivation already bearing names - often very well known names - but names which must be reduced to synonymy, even though as cultivated plants they are not quite the same as those bearing the valid name. Others will be variations of a species already in cultivation but differing markedly enough to merit distinguishing names. The variability of Acer Davidii is an example of this second type and these notes illustrate a method of approach towards the nomenclatural recognition of the variations in cultivation.

The description of Acer Davidii Franchet[1] was based on material collected by the Abbé David in 1869 in the Chinese province of Moupin. Later gatherings by Forrest, Maries, Wilson, Ward, and others have shown it to be a distinct although extremely polymorphic species and some authors have regarded it as embracing several infraspecific taxa. However, Fang[2], the latest monographer of the Chinese species, recognizing the great plasticity of the wild material, maintains only one such taxon, A. Davidii var. acuminifolium Fang, and reduces all others to synonymy. With this more conservative treatment it is easy to be in agreement.

[1] Plantae Davidianae 2: 30.

[2] Contr. Biol. Lab. Sci. Soc. China 11: 179 (1939).

In cultivation there exist two types of A. Davidii which exhibit quite distinct facies. One is a tree of compact habit, the branchlets having short internodes and carrying small leaves up to 11.5 cm. long and 7 cm. broad. The other is a tree of loose and open habit with long internodes and larger leaves up to 18 cm. long and 13 cm. broad. The former has originated from the seed introductions of Maries, Wilson, and Ward and the latter from three separate seed sendings of Forrest. (Plants from Forrest's seed have masqueraded in various gardens as Acer Forrestii Diels, which is, however, a different species readily distinguished from A. Davidii by its trilobed leaves). That these two types maintain their distinctness when propagated by seed indicates a considerable degree of homozygosity; that they are both of considerable horticultural value indicates that they must be given distinct nomenclatural recognition.

What form should the naming of these two cultivated groups of plants take? The differences they exhibit in cultivation are only expressions from a wide range of variability and from present knowledge do not warrant nomenclatural recognition under the International Code of Botanical Nomenclature. But the differences are of considerable horticultural importance; the difference in stature and the looser habit of the Forrest introduction, for instance, would suit it to an entirely different planting usage. The two types, in fact, are maintained in gardens only because of their horticultural differences. They are indeed cultivars and as such should be named in accordance with the International Code for the Nomenclature of Cultivated Plants.

But into which category of cultivar do they fall? As they are propagated by seeds and each comprises three units of wild origin, they are not clones. Neither are they lines, for each involves three units and selection is not necessary for stability. They are, in fact, assemblages of individuals which presumably show genetical differences but do not differ sufficiently from each other to warrant separate recognition.

Now how are we to decide whether either of these two groups should bear only the binomial? Are we to be guided by the morphological nearness of one group to the type specimen of Acer Davidii? Or are we to be influenced by the fact that one group bore the binomial before the other? If the former, then the Forrest introductions should bear the binomial; but this group by no means exactly matches the type - and it may be that the type itself will yet be introduced. If the latter, then the binomial still will be carried by atypical plants. Since the species name is not the exclusive name of any one individual or generation, it seems not improper that it should have only a general application. For these reasons both groups are here given cultivar names as follows:

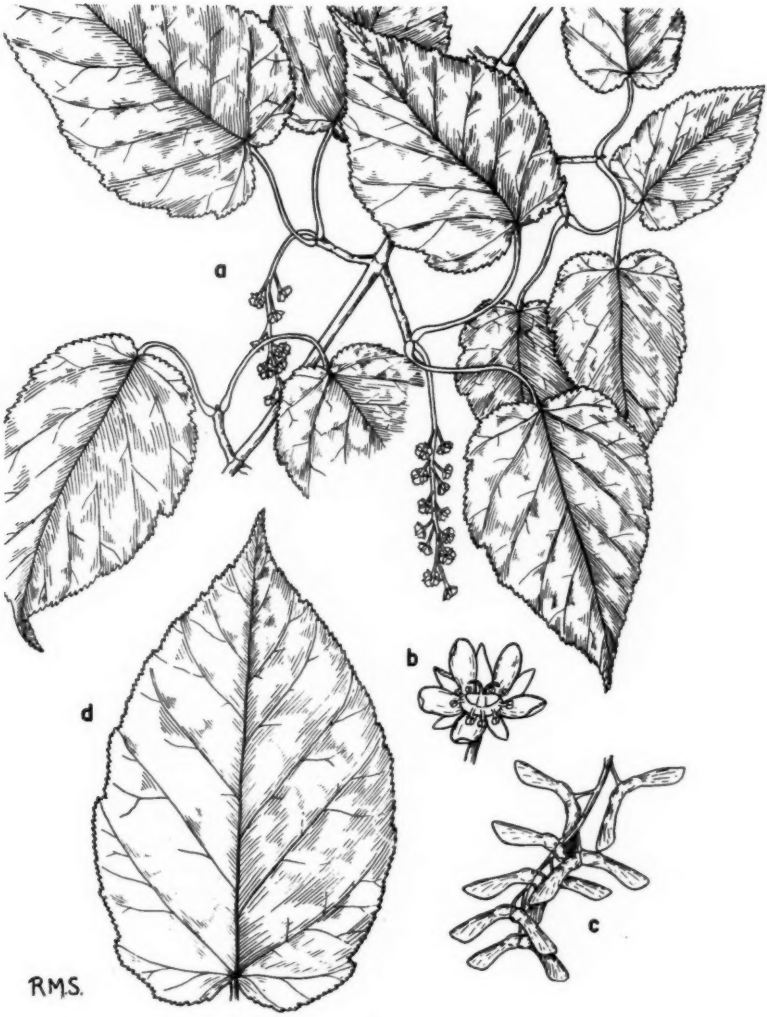


Fig. 30. Acer Davidii 'George Forrest': a, flowering branch x 1/3; b, flower x 4; c, fruit x 1/3; d, leaf x 1/2.

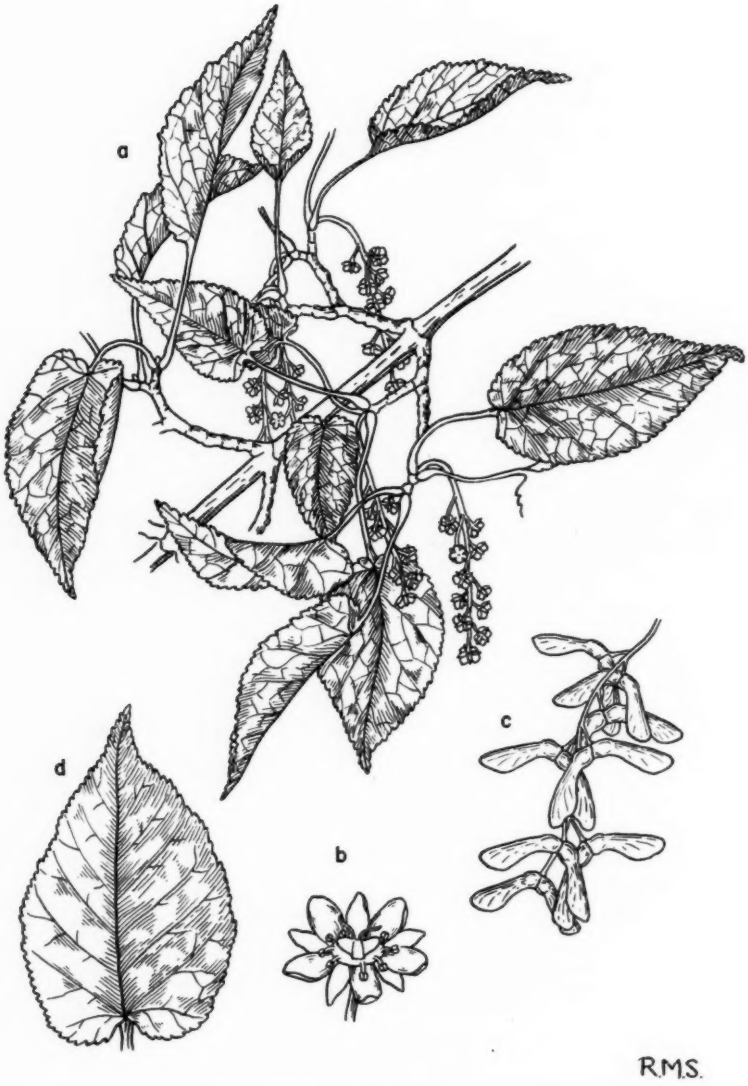


Fig. 31. Acer Davidii 'Ernest Wilson': a, flowering branch x 1/2; b, flower x 4; c, fruit x 1/2; d, leaf x 2/3.

Acer Davidii 'George Forrest'

An open tree of loose habit with internodes up to 10 cm. long and leaves up to 18 cm. long and 13 cm. broad.

Plants which fall within this cultivar have been raised from three separate Forrest seed introductions, the numbers of which have become confused in cultivation. They were distributed by the late Reginald Cory, who largely financed the Forrest expedition of 1921-22 during which they were gathered from Yunnan.

Acer Davidii 'Ernest Wilson'

A rounded tree of compact habit with internodes up to 6 cm. and leaves up to 11.5 cm. long and 7 cm. broad.

Plants which fall within this cultivar have been raised from seed introductions of Maries, Wilson, and Ward. The Maries introduction was distributed from the Coombe Wood Nurseries at the beginning of this century as Acer sp. (China). It was not recognized as A. Davidii until Wilson's seed number 341 was identified. This is the most widely grown of these introductions and was collected from Western Hupeh between 1907-1909 and was also distributed by Messrs. Veitch. The Ward plants, the numbers of which have been lost, were most probably collected from the Yung-Ning region of Western Yunnan. These were distributed by the late Sir John Stirling-Maxwell.

Both cultivars are growing at the Royal Botanic Garden, Edinburgh, and elsewhere in Great Britain.

The first Bulletin (Vol. 1, no. 1, 1957) of the Hardy Plant Society (of Great Britain) has recently been received at the Bailey Hortorium, and is here brought to the attention of those readers of Baileya who may find in its aims and interests something akin to their own. The expressed aims of the Society are "to further the culture and improvement of hardy herbaceous plants (excluding rock garden plants) and to stimulate interest in such plants both old and new."

The first Bulletin, of 20 pages, includes well-illustrated articles on various uncommon but desirable hardy herbaceous plants, on particular kinds (Iris Kæmpferi, Brunnera macrophylla, lupines), on planning the border and on growing plants for it from seed, and a book review.

Membership in the Society (including the Bulletin "as published") is 12 shillings 6 pence ($1.75) per year, applications and dues to be sent either to Mr. Noël Prockter (Secretary), 2-10 Tavistock St., London, W. C. 2, or to Mrs. F. E. Bloom (Treasurer), Bressingham Hall, Diss, Norfolk, England.

W.J.D.

PLANTS MOST COMMONLY CULTIVATED IN AMERICA

For a quarter-century the Bailey Hortorium has maintained a master card index of all the species and Latin-named varieties of ornamental plants known to be offered in trade catalogues and lists.

One measure of the extent to which a particular plant may be grown is the number of firms that list it in their catalogues. In the following enumeration the names of plants are in descending order of the number of domestic sources for each (indicated parenthetically after each name):

Spiraea Vanhouttei (386)
Lilium regale (374)
Weigela rosea (343)
(=W. florida)
Dicentra spectabilis (336)
Clematis paniculata (327)
(=C. dioscoreifolia
var. robusta)
Alyssum saxatile
'Compactum' (324)
Campanula carpatica (321)
Juniperus chinensis 'Pfitzeriana' (320)
Delphinium Belladonna (319)
Berberis Thunbergii (318)
Clematis × Jackmanii (314)
Gypsophila paniculata (313)

Undoubtedly there are other plants that are of equal or perhaps greater popularity, but whose names do not appear because they are catalogued by common names rather than by Latin names. Many are carried by firms whose lists use a minimum of Latin names, catering to clients who know plants primarily by English names. Here would belong such common and widely distributed plants as Norway maple, linden, arborvitae.

Other groups wholly uncounted are most annual flowers and those foliage plants distributed abundantly by chain-store outlets, where listing is by common name or by cultivar name (not included in our master index prior to 1957) - for example:

sweet pea (Lathyrus)	gladiolus	petunia
China aster (Callistephus)	sweet alyssum (Lobularia)	snapdragon (Antirrhinum)
African-violet (Saintpaulia)	jade plant (Crassula)	English ivy (Hedera)

G.H.M.L.

Notes on the Cultivated Euphorbiaceae
1. The Flowers of the Euphorbiaceae
2. Cnidoscolus and Jatropha

John Ingram

1. The Flowers of the Euphorbiaceae

The family Euphorbiaceae represents an exceedingly diverse and interesting assemblage of unusual plants, which vary in their respective habits from annual herbs to shrubs and even trees. Some species of Euphorbia are succulent, spiny, and even cactus-like. There are about 283 genera and 7300 species. Although the family contains many small genera, there is a tendency toward large genera culminating with Euphorbia, one of the largest genera of plants, estimated at 1600 species.

In addition to this extensive range in habit, there exists also a great variation in flower structure. Even though the Euphorbiaceae are grown mainly for their fine and beautiful foliage, the flowers of some species are quite showy, though many of the more inconspicuous ones are at times difficult to interpret. In order to acquaint the reader with some of these floral variations for future proposed considerations of various cultivated Euphorbiaceae, I am offering these brief comments on the flower, along with a few illustrations of representative flower types found in various members of the family.

Although the flowers of the Euphorbiaceae are not so uniform as they are in many other families, they are always unisexual (the plants are either monoecious or occasionally dioecious) and the ovary is always superior, usually 3-celled, with either one or two ovules per cell. As seen in fig. 32, A, J-P, the staminate flower is quite variable. In some cases, it is difficult to classify some specimens to genus when staminate flowers are lacking.

Because Euphorbia and its nine allied genera account for about one quarter of the species in the entire family, and since Euphorbia is the most widely spread single genus of the family outside of the tropics and subtropics, the cyathium (the apparent flower) is commonly encountered, and to most people it connotes the typical "flower" for the family. Some botanists of the past considered the

cyathium a single flower; morphologically this is not correct, however. The cyathium actually is an inflorescence and is sometimes solitary, but cyathia are usually arranged in umbellate or cymose clusters. A cyathium is composed of a single pistillate flower, represented by a single pistil, and several staminate flowers, each of which is reduced to a single stamen; all are surrounded and enclosed by a calyx-like involucre (fig. 32, A-D). Dioecious plants, of course, bear involucres with either staminate or pistillate flowers, never both. The involucre in Euphorbia is cup-shaped and usually bears four or five glands (sometimes one, as in the Christmas poinsettia, or as many as eight in some species) which are entire, petal-like, 2-horned, or variously dissected, alternating with four or five inner erect or fringed lobes. The genera closely related to Euphorbia are distinguished from it by the shape of the involucre and the number and arrangement of the glands associated with it; for example, in Pedilanthus (fig. 32, E) the involucre is shoe-shaped.

The flowers in the cyathium represent the bare essentials for being considered flowers—pistils or stamens. Although lacking the extra frills, the flowering plants can be quite attractive with their masses of green, yellow, red, or purple involucres. The involucral glands themselves are often colored or adorned with colorful appendages. Frequently accompanying the cyathium are leafy bracts which are often large and gaily colored, similar to the brilliant red bracts of the Christmas poinsettia.

In addition to the ten genera having cyathia, the other members of the family have more or less typical-appearing unisexual flowers, usually with a calyx and sometimes even a corolla as well. Besides stamens or a pistil, flowers frequently have floral glands. Fig. 32, J-P illustrates flowers of various genera, showing two to numerous stamens, the stamens free or variously united, and also some flowers with and without corollas.

The pistillate flower of the Euphorbiaceae is essentially quite standard throughout the family. The ovary is generally 3-lobed, the styles usually 3 (sometimes united), with the greatest variation in the stigmas (fig. 32, F-I). These flowers, like the staminate, come with or without a corolla, and often the pistillate flower of a given species may lack petals when the corresponding staminate flower has them.

I have not intended to discuss or illustrate every existing variation in the flowers within the family, but have attempted to elucidate the complexity of the problem by discussing and illustrating a few representative types, thus giving some indication of the extent of variation found in the flowers of the Euphorbiaceae.

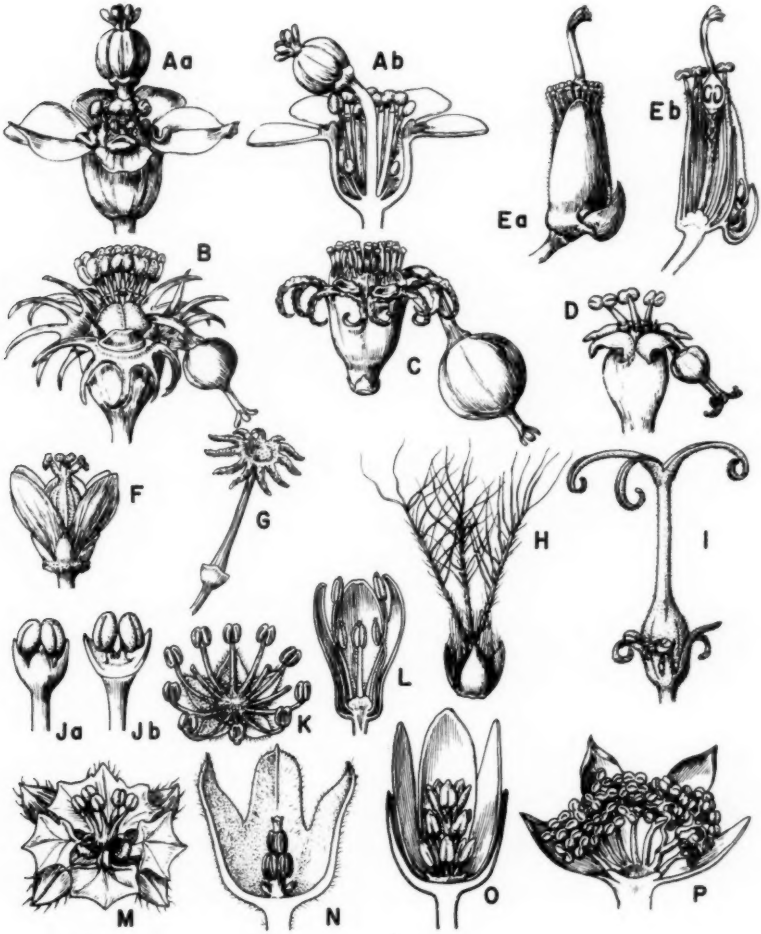


Fig. 32. Floral structures in the Euphorbiaceae, variously enlarged. A, Euphorbia coecorum Mart.: a, cyathium; b, same, vertical section. B, Euphorbia sarcodes Boiss., cyathium. C, Euphorbia phosphorea Mart., cyathium. D, Euphorbia Cyparissias L., cyathium. E, Pedilanthus retusus Benth.: a, cyathium; b, same, vert. sect. F, Jatropha multifida L., pistillate flower. G, Hura crepitans L., pistillate fl. H, Acalypha amblyodonta Muell. Arg., pistillate fl. I, Mabea fistulifera Mart., pistillate fl. J, Sapium sebiferum (L.) Roxb.: a, staminate fl.; b, same, vert. sect. K, Croton Eichleri Muell. Arg., staminate fl. L, Manihot pedicellaris Muell. Arg., staminate fl., vert. sect. M, Chiropetalum tricuspidatum (Lam.) Juss., staminate fl. N, Hevea discolor Muell. Arg., staminate fl., vert. sect. O, Aleurites moluccana Willd., staminate fl., vert. sect. P, Ricinus communis L., staminate fl., vert. sect. (D, from life; M, redrawn from Descole, Gen. & Sp. Plant. Argent.; all others redrawn from Martius, Flora Brasiliensis.)

2. Cnidoscolus and Jatropha

Cnidoscolus and Jatropha are two closely related genera which, at certain times in their history, have been considered to be inseparable into distinct genera. Jatropha was proposed as a genus by Linnaeus, and, in his Species Plantarum, ed. 1, 1006 (1753), he described seven species, of which only three are still retained in Jatropha. Two of the four excluded species are now included in Cnidoscolus, described by Pohl in his Plantarum Brasiliae Icones... 1: 56, table 49 (1827). In most of the recent treatments, these taxa have been retained as independent genera. However, some of the species now recognized as Cnidoscolus are occasionally offered as Jatropha.

The name Cnidoscolus (pronounced nid-os´-co-lus) is derived from two Greek words meaning "nettle" and "spine." This is an excellent descriptive name, for once one feels the painful sting of these plants, one does not soon forget it. It was reported in the late nineteenth century that the Negroes in the British colonies where Cnidoscolus is native called it "tread-softly," a common name which is still in use today.

The sting caused by contact with these hypodermic-needle-like hairs is severe enough to remain in one's memory for some time. This is reminiscent of the incident related by Benvenuto Cellini in his fabulous autobiography in which he recalls, as a lad of five, his father's showing him a salamander in the fire. Because of Benvenuto's tender years, the father was anxious that the boy remember this remarkable event, so he soundly boxed the boy's ears, explaining that the pain caused was not malicious intent but merely to impress the memory of the salamander on his young mind through association with a very painfully unforgettable experience. The memory of the first encounter with a cnidoscolus does not soon fade, but when accorded the proper respect befitting it, it makes a very attractive addition to one's garden. The genus is easily distinguished from Jatropha by its white, apetalous flowers, and the stinging hairs which are found on stems, leaves, and flowers.

Jatropha likewise is a name derived from two Greek words, meaning "physician" and "food," alluding to its medicinal properties. Its seeds yield a purgative oil which is very similar to the once popular household remedy, castor oil, whence comes "physic-nut," the common name of Jatropha Curcas.

Of all the cultivated Euphorbiaceae, jatrophas are among those having the largest and most showy flowers. The flowers have a calyx and a brightly colored corolla of yellow, vermilion, scarlet, rose, or purple, and in addition, they have large, handsome, green leaves, a desirable combination that makes very attractive plants.

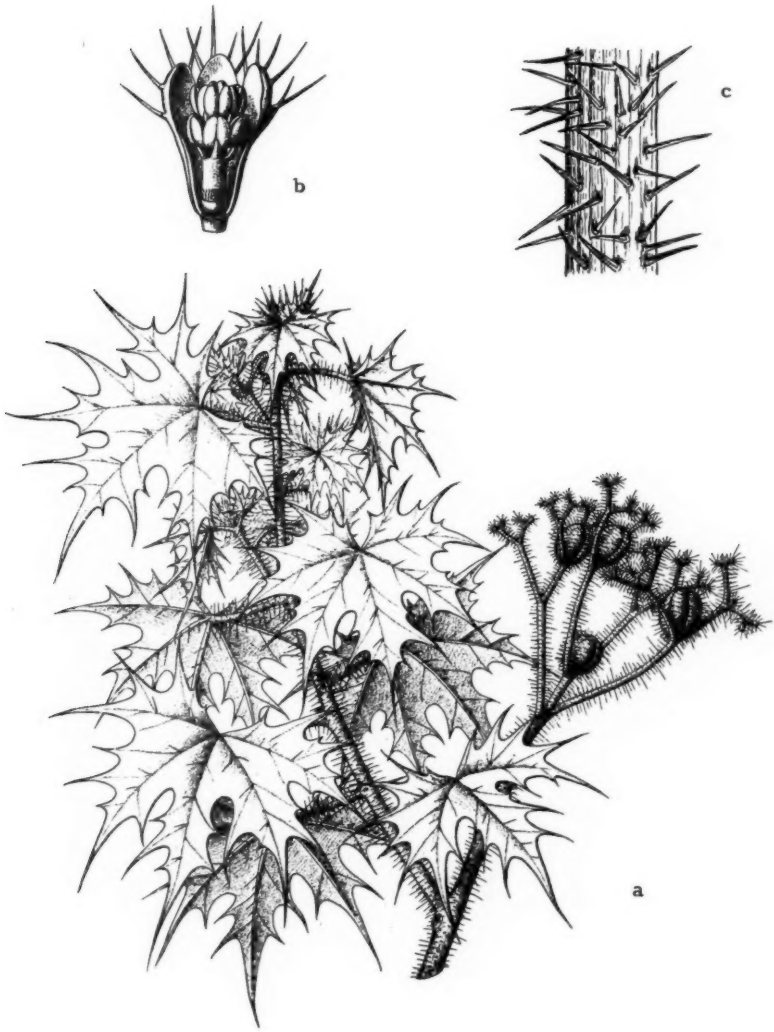


Fig. 33. Cnidoscolus angustidens: a, habit; b, staminate flower, vertical section; c, section of stem showing stinging hairs. (In part, from Pax in Engler's Das Pflanzenreich.)

The cultivated species of Cnidoscolus and Jatropha are native to warm regions, and they have been grown successfully as ornamentals in southern Florida and southern California from cuttings and seeds.

Keys to the Genera and Cultivated Species

1. Plants armed with stinging hairs; flowers white, apetalous. . . . . Cnidoscolus
   2. Plants **glabrous**, or, if hairy, the hairs not stinging; flowers yellow, scarlet, **rose**, or purple, with petals. . . . . .Jatropha

Cnidoscolus

1. **Herbaceous perennials 1/3 to 1/2 m. tall; calyces bristly.**
   2. Teeth on leaf-margins long attenuated. . . . . .C. angustidens
   2. Teeth on leaf-margins blunt or acute. . . . . .C. texanus
1. Shrubs or small trees 1 to 5 m. tall; calyces glabrous or hairy but never bristly.
   3. Herbage nearly glabrous, succulent; petioles much shorter than the leaf-blades; calyces glabrous. . . . . .C. Chayamansa
   3. Herbage with hairs; petioles as long as or longer than the leaf-blades; calyces hairy. . . . . C. urens

Jatropha

1. Dwarf shrub to about 1/2 m. tall, with swollen stems; leaves **peltate;** flowers coral-red. . . . . J. podagrica
1. Large shrubs or trees to about 6 m. tall, with stems never swollen; leaves entire or lobed, pinnately or palmately veined but never peltate.
   2. Leaves pinnately veined.
      3. Leaves always entire, oblong-ovate, the base cuneate; flowers purple, the corolla urceolate. . . . . .J. Standleyi
      3. Leaves sometimes entire, sometimes toothed, oblong, oblong-obovate, or lanceolate, frequently constricted in the middle into a fiddle-shape, the base rounded, acute, or hastate; flowers scarlet to vermilion. . . . . J. integerrima
   2. Leaves palmately veined.
      4. Leaves nearly orbicular in outline, deeply parted (almost to the base of the blade) into 8 to 12 entire or cut lobes; flowers coral-red. . . . . J. multifida
      4. Leaves not orbicular in outline, frequently entire or merely toothed on the margin, or, if lobed, never parted below the middle of the blade.
         5. Leaves ovate to 3-5-lobed, the margin entire, the petioles almost as long as the blades; flowers yellow. . . . . .J. Curcas
         5. Leaves lanceolate to oblong or oblong-ovate, sometimes constricted in the middle into a fiddle-shape, the base rounded, acute, or hastate, the margin often toothed, the petioles never as long as the blades; flowers scarlet to vermilion. . . . . .J. integerrima

Fig. 34. Jatropha podagrica. (Adapted from Curtis's Botanical Magazine, t. 4376 [1848].)

Cnidoscolus angustidens Torrey (in Emory, Report of the United States and Mexican Boundary Survey 2[1]: 198 [1859]). Although this species has not yet been offered in the trade, it has been illustrated here (fig. 33) in hopes that it will in time come into cultivation. It is a striking plant, easily distinguished from other Cnidoscolus species by its leaves with their long attenuated marginal teeth, and by its large and numerous transparent hairs. It is a native of southern Arizona and northwestern Mexico.

Cnidoscolus texanus (Mueller Argoviensis) Small (Flora of the Southeastern United States, 706 and 1333 [1903]). (Jatropha texana Mueller Argoviensis.) This species is very reminiscent of the previous species in its height (about 1/2 m. or 18-24 in.) and numerous hairs. The sepals, however, are about twice as long (2.5 cm. or 1 in.) as in C. angustidens, and its leaves lack the long attenuated marginal teeth (fig. 35, D). This species is common in Arkansas and Texas.

Cnidoscolus Chayamansa McVaugh (Bulletin of the Torrey Botanical Club 71: 466 [1941]). (Jatropha urens var. inermis Calvin.) For those who wish to cultivate a cnidoscolus without the challenge of stinging hairs, this is the species to grow, because it is reported to be nearly glabrous, with few or no stinging hairs. As yet this plant has not been listed commercially, but it has been cultivated at Coconut Grove in Florida by David Fairchild, and also has been reported in cultivation in Cuba. Cnidoscolus Chayamansa is a native of Yucatan, where it is known as "chaya." The natives eat the young leaves and shoots, which contain a considerable amount of vitamin C.

Cnidoscolus urens (Linnaeus) Arthur (Torreya 21: 11 [1921]). This species grows to about 5 m. tall and has bright, shining, green leaves (fig. 35, Ea, Eb), with the usual white flowers typical of the genus. It is native to southern Mexico, the Lesser Antilles, and southward to Argentina.

Jatropha podagrica Hooker (in Curtis's Botanical Magazine, t. 4376 [1848]). Unique among the jatrophas, this has swollen stems, peltate leaves, and an inflorescence of coral-red flowers (fig. 34), and attains a height of about 1/2 m. It is a native of Central America, where it is called "tartogo."

Jatropha Standleyi Steyermark (Field Museum of Natural History, Botanical Series 22: 152 [1940]). This species is probably not yet widely cultivated. It is easily distinguished from its cultivated relatives by its purple flowers and cuneate leaves (fig. 35, B).

Jatropha integerrima Jacquin (Selectarum Stirpium Americanum Historia, 256 [1763]). (Adenoropium integerrimum Pohl.) This species has usually been offered under the species name of J.

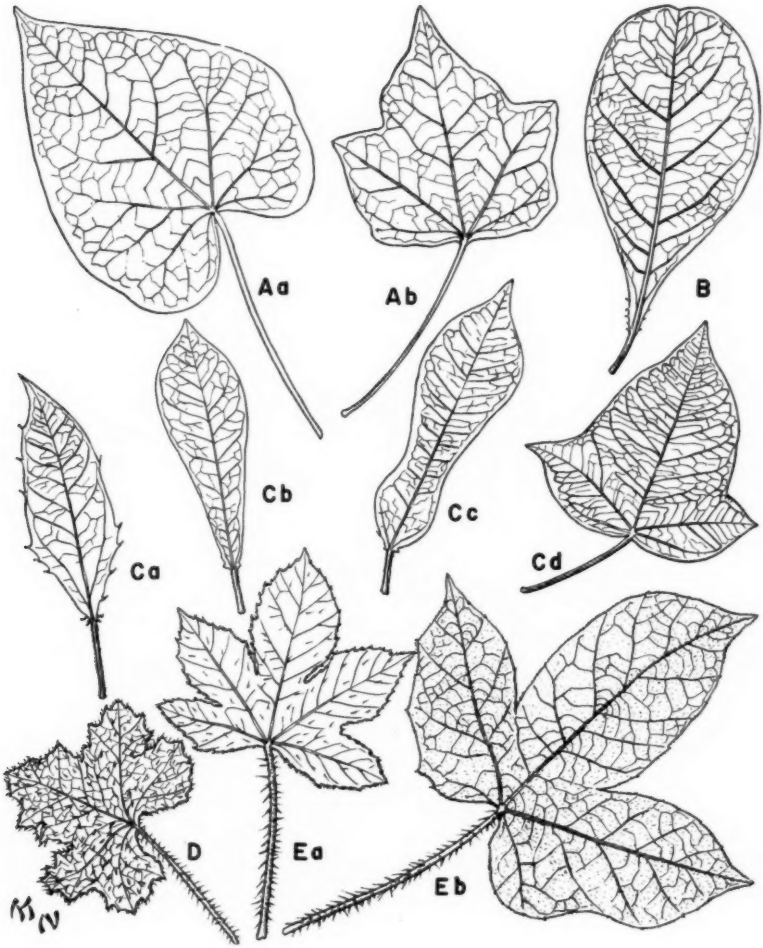


Fig. 35. Representative leaves of some cultivated species of Cnidoscolus and Jatropha. Aa, Ab, Jatropha Curcas. B, Jatropha Standleyi. Ca-Cd, all Jatropha integerrima. D, Cnidoscolus texanus. Ea, Eb, Cnidoscolus urens.

Fig. 36. Jatropha multifida: a, habit; b, staminate flower; c, same, vertical section; d, pistillate flower; e, same, with petals removed.

hastata, but, as has been shown by McVaugh (Bulletin of the Torrey Botanical Club 72: 274-275 [1945]), the two taxa described as J. integerrima and J. hastata are merely variant forms of the same species and should therefore be merged under one species name. The tremendous variability of leaf-shape is illustrated in fig. 35, Ca-Cd. Jatropha integerrima has the largest flowers of the cultivated species (2.5 cm. across), and this is probably one of the reasons why it has remained in cultivation so long in its native Cuba, where it is known by the common name of "peregrina."

Jatropha multifida Linnaeus (Species Plantarum, ed. 1., 1006 [1753]). (Adenoropium multifidum Pohl.) The two outstanding features of this species are its scarlet flowers and its large (to 3 dm. or more across), divided, palmate leaves (fig. 36). It is a very striking and attractive plant, reaching a height of about 6 m. It is a native of tropical America and is commonly referred to as coral-plant or physic-nut.

Jatropha Curcas Linnaeus (Species Plantarum, ed. 1, 1006 [1753]). This can be distinguished from its cultivated relatives by its yellow flowers and its ovate-cordate to 3-5-lobed leaves (fig. 35, Aa, Ab). It generally attains the height of a small tree of about 3 m. It also is a native of tropical America. Its common name is Barbados-nut or physic-nut.

The author of the preceding article, Dr. John Ingram, joined the staff of the Bailey Hortorium on July 1, 1957. A native Californian, he received his Master of Science degree from the University of Southern California, and his Ph.D. degree from the University of California at Berkeley. At the former institution, his work in taxonomy was done under Dr. L. C. Wheeler; at the latter, under Professors H. L. Mason, Lincoln Constance, and (in morphology) Adriance Foster. His special interests are the morphology and the taxonomy of the Euphorbiaceae.

The Stemless Thistle, Cirsium acaule

Gordon P. DeWolf, Jr.
Botany School
Cambridge University
England

One man's meat is another man's poison, and a roadside thistle here in Cambridge looks to me like an excellent rock garden plant for America. I know that the word "thistle" conjures up visions of spires of prickly stems and foliage, but there are exceptions, at least in respect to rampaging size and exuberance.

Circium acaule (Linnæus) Scopoli, the Stemless Thistle, has also been known as Carduus acaulis Linnæus and Cnicus acaulis Hoffmann. Hortus Second notwithstanding, it is not the same as Carlina acaulis Linnæus. It forms a flat rosette of dark green, pinnatifid, spiny, typically thistle-like leaves, 20 to 30 cm. across. In the center of this rosette, in midsummer, there appear one to three sessile heads 3 to 4 cm. long, with bright rosy-purple florets. The whole arises from a short, stout rootstock which, through the years, will branch and produce a compact clump of rosettes, each with its flower. For best results this should probably be grown in a poor, dry, limy soil, for in a rich soil it will be likely to luxuriate beyond all reason. In any event, the dense rosettes are strong enough to compete successfully with pasture grasses, so that dairymen regard it as a pernicious weed. But this same sturdy character should recommend it to American gardeners, who must contend with the hot dry summers of our continental climate.

Cirsium acaule ranges from central Spain northward to northern England, southern Scandinavia, and Estonia, and eastward through Italy to the Balkans and western Asia. In various parts of its range it is known to hybridize with other species of Cirsium. These hybrids are generally dwarfish plants, with variously elongate and branched peduncles.

Because there seems to be some confusion in the literature about the generic names of some of the thistles, I am appending here a short key to the genera of the common, prickly leaved, purple-flowered ones. Because the family Compositæ (to which the thistles belong) is a large one - there are about 900 genera and 15,000 species - the characters used to separate genera and species are sometimes recondite. However, the characters that separate the genera of thistles seem to be fairly constant.

If one cuts through the flowering head of a thistle, lengthwise, one sees that the flower-stalk, or peduncle, ends in a more or less fleshy and flattened knob, to which the florets are attached. This

is the receptacle. If one has selected a head that has finished flowering, one finds that the "seeds," or achenes, come away from the receptacle easily. The receptacle may then be examined to see whether its surface is pitted or not, and whether there are bristles on its surface, or not. A magnifying lens of 10 - 14 power will probably be helpful. The body of the achene, as noted in the key, may be hairy or without hairs (glabrous). In any case, there should be a ring of one to several rows of hairs around the apex - this is the pappus. One should examine these hairs with a lens to see whether they are smooth, or rough, or whether each large hair has secondary shorter hairs on it so that it looks like a feather.

Key to the Genera of the More Common Thistles

1. Leaves variously variegated white along the veins; receptacle hairy, not pitted; pappus of many rows of rough hairs united below into a basal ring; achene otherwise glabrous. . . . . Silybum

1. Leaves uniformly green throughout; receptacle always pitted.

   2. Receptacle with no hairs or bristles between the pits, pits with membranous, toothed rim; pappus of several rows of rough hairs united below into a ring; achene otherwise glabrous. . . . . Onopordum

   2. Receptacles with hairs or bristles between the pits.

      3. Achenes glabrous.

         4. Pappus of several rows of rough hairs, united at the base. . .Carduus

         4. Pappus of several rows of feathery hairs, united at the base. . . . . .Cirsium

      3. Achenes covered with appressed, forked hairs; pappus of one row of feathery hairs. . . . . .Carlina

Fig. 37. Cirsium acaule. (From Hegi, Illustrierte Flora von Mittel-Europa.)

Fig. 38. Dichorisandra Reginae flowering at Cornell University.

Dichorisandra Reginae

Harold E. Moore, Jr.

Plants noteworthy for their foliage frequently have been first described from material in cultivation. All too often, such plants have been described as species and assigned to a genus on the basis of superficial resemblances without waiting for flowers and fruits to appear. Commonly, the plants remain in collections and their descriptions and names remain in the horticultural literature, but one may search in vain for further published records adding to the original description. These floating names are the source of continued annoyance and error.

A handsome foliage subject which attracted the attention of the Queen of the Belgians at an exposition in Brussels in 1891 provides an example of such a species. Lucien Linden and Émile Rodigas subsequently honored the Queen by describing and illustrating the sterile plant as Tradescantia Reginae in L'Illustration Horticole for 1892. Although Rodigas commented to the effect that the plant had no need of flowers to establish its beauty, to establish its generic relationship is another matter. Vegetative characters in the spiderwort family (Commelinaceæ), to which the species belongs, do not provide reliable means for determining the genus. Therefore, the true relationship of Tradescantia Reginae has long been a matter of conjecture. Treatments of the species in encyclopedias of gardening of the past and present fail to describe the flowers. As late as 1951, the Royal Horticultural Dictionary of Gardening stated, "The flowering of this species does not appear to have been recorded." In Parey's Blumengärtnerei, Bonstedt lists Pyrrheima Loddigesii (the correct name for which is Siderasis fuscata - see Baileya 4: 27-30 [1956]) variety Reginae Hort. No reference to Tradescantia Reginae is given but the accompanying description of foliage only is unmistakably of that species, accompanied by an unexplained parenthetical reference to Dichorisandra.

The parenthetical reference, whatever the reason for it, gives a clue to the genus in which Tradescantia Reginae belongs. A plant of T. Reginae obtained from Julius Roehrs Company in 1954 has become well established and has begun to flower recently at Cornell

University. Eight robust stems have developed, two of which bear terminal inflorescences of blue and white flowers as this is written. The foliage varies even on the same stem. One stem, however, bears some leaves agreeing with those illustrated by Linden and Rodigas. The structure of the anthers, which dehisce through pores at the tip, shows clearly that the plant belongs in the genus Dichorisandra. Therefore, the combination Dichorisandra Reginae is proposed formally here. An unacceptable combination has appeared previously as Dichorisandra Regina in Bailey's Standard Cyclopedia of Horticulture, where it was treated as a horticultural synonym of Tradescantia Reginae. Recent entries in catalogues have also been under Dichorisandra. A specimen of the plant described hereafter has been deposited in the L. H. Bailey Hortorium as Moore 7519.

Dichorisandra Reginae (L. Linden & Rodigas) H. E. Moore, new transfer.

Tradescantia Reginae L. Linden & Rodigas, in L'Illustration Horticole 39: 29, pl. 147 [March] (1892); 40: 39, pl. 173, fig. 3 (1893).

Dichorisandra Regina Hortorum ex Bailey, Standard Cyclopedia of Horticulture 1003, 3363 (1914, 1917), in synonymy.

Pyrrheima Loddigesii Haaskarl variety Reginae Hortorum ex Bonstedt, in Parey's Blumengärtnerei 1: 211 (1931).

Dichorisandra Reginae has tuberous-tipped fleshy roots and ascending to suberect red-purple, green-flecked and -lined stems which are often clustered and to 30 cm. high in established plants. The nodes are prominent and wider than the short or elongate internodes. Leaves are borne in two ranks along the stem. The tubular red-purple, green-flecked or -splotched or nearly entirely green sheaths are pale to brownish bristly-hairy at the top but elsewhere are glabrous. The lower sheaths are generally bladeless or with reduced blades, soon becoming brown and membranous. In caespitose plants, the youngest stems may have bladeless sheaths to or well above the middle. A short petiole, seldom exceeding 4 mm. in length, expands into a lanceolate-acuminate blade to 18 cm. long, 6.5 cm. wide. From near the rounded to subcordate base, two broad submarginal silvery bands often extend the length of the blade. Silvery flecks directed toward the margin and center in a fishbone pattern are usual even when the broader longitudinal bands are lacking. The center of the leaf may be green or, especially when young, may be flushed with red-purple. Lower surfaces of the leaves are often similarly flushed (prominently so when young), but at maturity may be entirely green, or red-purple only near the margin or in splotches. Both surfaces appear glabrous but under a lens minute pale hairs (drying somewhat brownish) are visible below, particularly on the midnerve.

Fig. 39. Dichorisandra Reginae: a, habit; b, lower branch of inflorescence x 2; c, flower in bud x 3; d, flower, face view x 3; e, flower, vertical section x 3; f, anther x 5.

A minutely pale (brownish when dried) -hairy compact panicle terminates the stem. The brownish lower branches of the panicle bear 2-6 flowers on short lateral green axes. The uppermost flowers are often solitary. Each short-pedicelled flower is subtended by a small green bract that soon darkens and withers. The boat-shaped glabrous sepals, to 11 mm. long, 7 mm. wide, are white inside but are heavily flushed with blue and tipped with green outside. These sepals are fleshy in texture, maintaining their shape when the fugacious petals have deliquesced. In bud, the upper sepal is longer than the two lateral sepals and encloses them at the tip. The petals are broadly obovate and blunt, to 13 mm. long, 11 mm. wide, white from the base to the middle, then blue-violet. Individual flowers are somewhat irregular in appearance since the two upper petals remain imbricated where they join and are nearly straight while the lower petal is separated from them and somewhat depressed, giving the effect of a lip. Six essentially equal stamens bear slender blue anthers on white filaments. The stamens are not regular in position, however. The upper three are close together, with the stamen opposite the upper sepal borne above the two which are opposite the upper petals. These last stamens are approximate. The three lower stamens are nearly in line, separated, with the lowermost (opposite the lower petal) somewhat depressed. Pollen is shed through terminal pores. The sharply 3-angled ovary is often stained with purple; the blue style terminates in a papillate, three-sided stigma.

Central Peru is the region from which Dichorisandra Reginae was introduced into Belgium in 1890, but further notes on its discovery were not given in the original account. Viewing the variation in the plant before me, I find it difficult to consider as botanically distinct another sterile plant from central Peru described and figured as Tradescantia superba several months after Tradescantia Reginae had appeared (L'Illustration Horticole 39: 69, pl. 155 [1892]). Unfortunately, I have not studied any material agreeing exactly with the plate nor have I seen plants listed as T. superba. Similarly, though introduced from Ecuador, Dichorisandra angustifolia, another species that appeared in the same volume as the two tradescantias previously mentioned (p. 81, pl. 158), is likely to prove identical with or closely related to Dichorisandra Reginae. Both Tradescantia superba and Dichorisandra angustifolia seem to have disappeared from cultivation. They are not currently listed even by botanical gardens, though they may persist as conservatory plants. Plantsmen knowing the whereabouts of authentic material of these two species are requested to inform the writer so that an attempt may be made to verify their generic position.

Dichorisandra Reginae differs markedly from other cultivated species of the genus in the decidedly two-ranked arrangement of the leaves. I have found no description of a species in the litera-

ture that corresponds to D. Reginae though D. inæqualis Presl may be close. Descriptions of members of the Commelinaceæ, as has been noted before (Baileya 4: 27 [1956]), are often inadequate and Dichorisandra needs to be restudied. The arrangement of leaves, whether two-ranked or spiral, is seldom mentioned though it is an apparently useful character and one that generally shows well in illustrations.

The culture of this species is not difficult but it does appear to like more warmth than most Tradescantia species. At Cornell, the plants are grown in the conservatory where the night temperature is 75° F. A light, well-drained soil mixture (peat and sand at Cornell) properly fertilized should produce robust plants, which are ordinarily propagated by root- or stem-cuttings.

THE LEOPARD PLANT — A CORRECTION

A leading authority on eastern Oriental members of the aster family (Compositæ) is Siro Kitamura, of Kyoto Imperial University, Japan. His publications on the Compositæ of Japan have been published in the Memoirs of that University's College of Science.

Recently, Dr. Harold St. John, of the University of Hawaii, wrote to inquire whether I had known of Kitamura's treatment of the leopard plant when I was preparing the account of it for Baileya (5: 98-100 [March, 1957]). I had to confess I had not. A study of his treatment (Mem. Kyoto Imp. Univ. Coll. Sci. 16: 179-183 [1942]) showed the seriousness of my negligence, for Kitamura considered this plant to belong to a separate genus, Farfugium - a view accepted by Dr. St. John.

According to Kitamura, the genus Farfugium (founded by John Lindley about a century ago, but never regularly adopted) differs from Ligularia in that (1) the leaves are involute rather than revolute in bud, a condition very apparent as they unfold; (2) the anthers are bifid at the base rather than obtuse; and (3) the achenes are densely hirsute rather than glabrous. Kitamura separates both Farfugium and Ligularia from the genus Senecio by the petiole-base's forming a sheath that envelopes the stem.

If Kitamura's views are followed, and it is expected that they will be in Hortus III, the name for the leopard plant is Farfugium japonicum (Linnaeus f.) Kitamura. This combination was first published as a note at the end of the index of Acta Phytotaxonomica Geobotanica 8: 268 (1939). It is based on Tussilago japonica of Linnaeus the younger.

G.H.M.L.

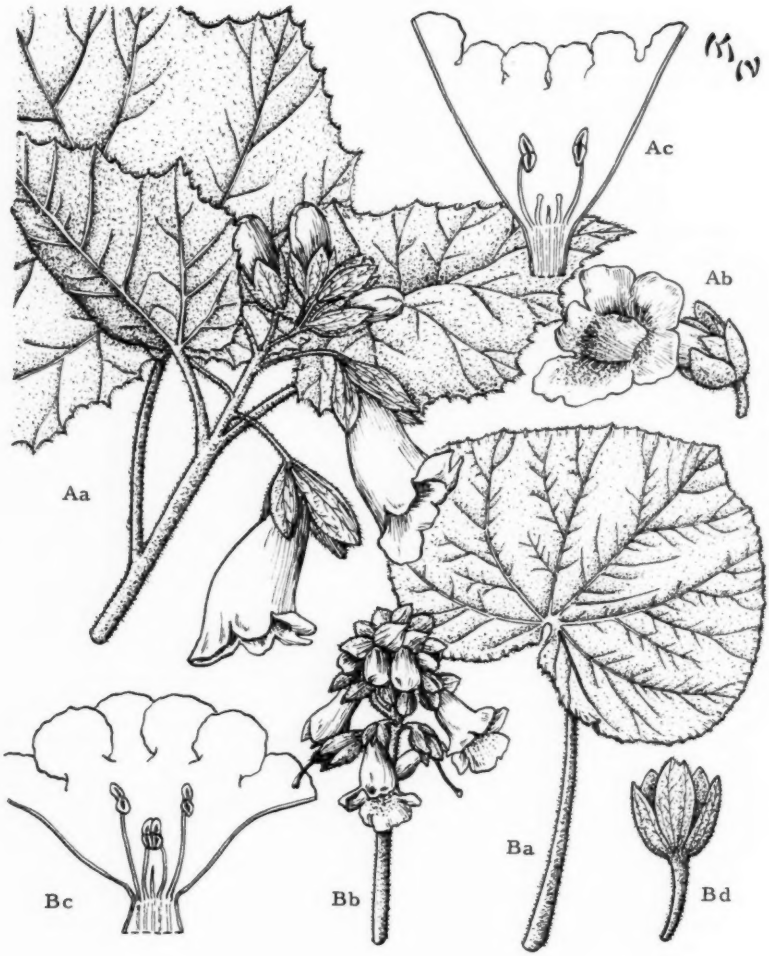


Fig. 40. A, Martynia annua: a, flowering shoot x 4/5; b, flower x 4/5; c, corolla split and expanded x 4/5; B, Ibicella lutea: a, leaf x 1/3; b, inflorescence; c, corolla split and expanded, x 1; d, calyx x 1.

Proboscidea and Other Unicorn Plants (Martyniaceae)

George H. M. Lawrence

Most pickle-producing plants belong to the cucurbit family, and include cucumbers, gherkins, and melons. Other pickle-plants include the unicorn plants, a name used loosely for members of the Martyniaceae, and alluding to the interesting fruit, which is a woody capsule terminated by a slender beak and having an outer covering resembling a thick, fleshy skin, in most genera abundantly covered with viscid glands or soft prickles. When ripe, the fruit splits open lengthwise from beak-tip towards the base and the two halves of the beak separate and curve upward and outward, resembling the tusks of a mammoth (fig. 41). These fruits, when quite young, may be pickled and used for food just as are young cucumbers. The unicorn plants are grown also for their attractive flowers, and the dried long-pronged fruits are sought by flower-arrangers.

The family is largely an American one, whose members may be found from the Atlantic and Gulf coasts of the United States, through Central America and the West Indies, south to Argentina. It is composed of five genera of annual or perennial herbs. The flowers resemble somewhat those of a foxglove (Digitalis), but have flaring lobes and a more slender tube. The plants are mostly mound-shaped, less than a meter high, with the inflorescences borne among or only just above the foliage. Species of three of the genera are sometimes cultivated, and these genera may be separated as follows:

1. Stamens 2; fruit with beak or horns less than half as long as the body. . . . . Martynia

1. Stamens 4; fruit with beak or horns as long as body or longer.

   2. Sepals united into a spathe-like calyx; fls. in a loose open inflorescence. . . . . Proboscidea

   2. Sepals separate; fls. congested in a dense raceme. . . . . Ibicella

This article appears at this time because too few persons use the correct names for the several kinds of unicorn plants in cultivation. Most plantsmen lump all under the one generic name, Martynia, and most of them incorrectly use the name M. fragrans for a plant that is not that species.

The easiest of the three genera to identify is Ibicella. It consists of two species, of which only one, I. lutea, is cultivated. The flowers are bright yellow, varying slightly to orange- or greenish-yellow. They are in a dense raceme (fig. 40Bb) and each flower has only two anther-bearing stamens. The fruit is singular in that it is markedly ribbed and, unlike that of the other two genera, is not glandular-viscid.

Ibicella lutea is generally listed as Martynia lutea, and though seed is currently available from several foreign sources, it is known to be offered this year domestically only by the George W. Park Seed Co., Greenwood, S. C.

The species was introduced from Brazil to Europe in 1824, and in the next year John Lindley of the Chelsea Physic Garden, London, first saw it and named it Martynia lutea. Otto Stapf recognized it to be something other than Martynia and in 1895 transferred it to Proboscidea as P. lutea. The genus Ibicella was founded by the late Glen P. Van Eseltine in 1929 when he published the combination Ibicella lutea. The species is native in southern Brazil, Uruguay, Paraguay, and northern Argentina. It is considered a noxious weed in Queensland, Australia. (The name Ibicella means "little goat" or "chamois," in allusion to the resemblance of the curved horns of the mature fruit to those of the chamois or ibex.)

Proboscidea

The separation of Proboscidea from Martynia was made in 1762 by Johann Keller, a German botanical artist who wrote or edited three books for which he prepared the color plates. One of these books is the little-known Icones Plantarum which Casimir Schmidel had first published in 1747.

Keller appears not to have been an astute botanist, but he was an excellent illustrator (see reproduction of a part of one of his plates in fig. 41). Schmidel's original Icones came out six years before Linnaeus' Species Plantarum - the work famous as the starting point of our modern plant nomenclature. Naturally, Schmidel used in his book the polynomial form of nomenclature in vogue before the publication of Linnaeus' Species Plantarum. Keller, when editing the edition of 1762, knew of Linnaeus' work and cited it, using binomials for Linnaean species but otherwise retaining Schmidel's polynomials. Because Keller did not use binomial nomenclature consistently, we are not allowed to adopt such binomials as he did create.

Keller noted (page 52) that in the Species Plantarum Linnaeus had confused two different species under the name Martynia annua, explaining that Linnaeus himself must have later recognized this, since he more correctly delineated that species in the fifth edition

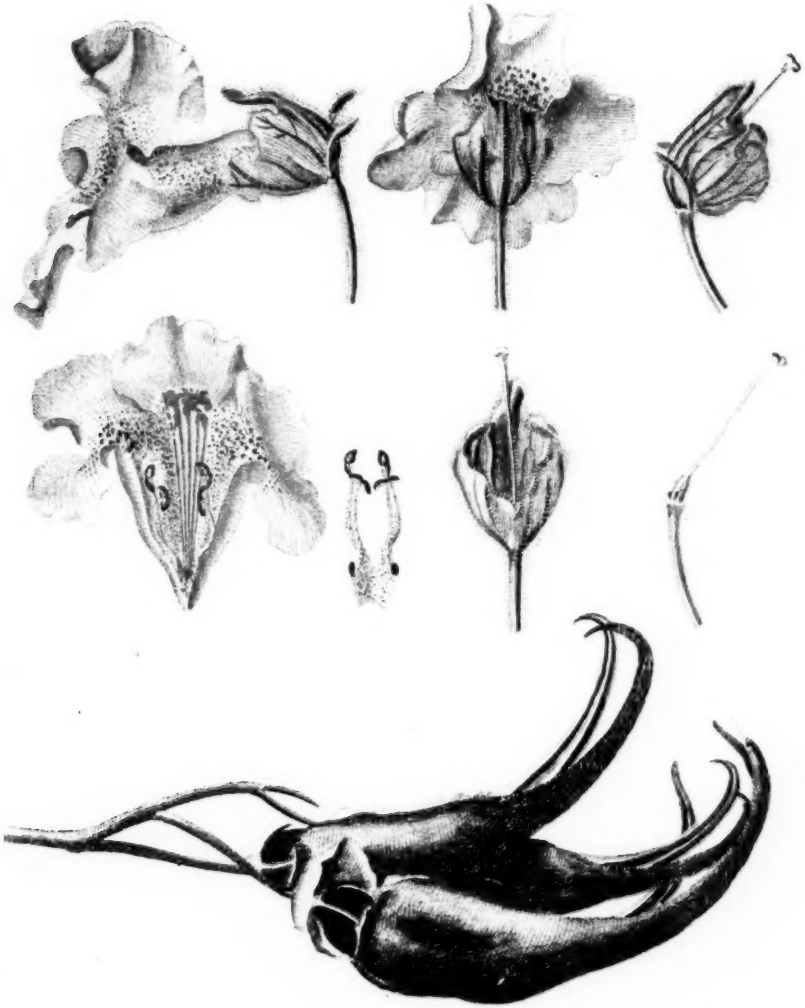


Fig. 41. Proboscidea louisianica: (top row, left to right) flower side view; same viewed from back; calyx; (center row) corolla split and expanded; stamens; spathe-like calyx and pistil; pistil; (bottom) pair of fruits beginning to dehisce: note falling away of fleshy outer coat. All natural size. (Adapted from Keller in Schmidel's Icones Plantarum.)

of his Genera Plantarum (1754). For this reason, Keller removed from the Linnaean concept of Martynia that plant which had the sepals united and whose stamens were four in number, and described it as the new genus Proboscidea, giving it the name Proboscidea Jussieui. (The name Proboscidea is from the Greek, meaning "snout," in allusion to the long beak of the fruit.)

It has been thought by some that Keller's 1762 edition of Schmidel's book was only a reprint of the 1747 edition. Had that been true, Keller's new generic name would antedate Linnaeus' Species Plantarum of 1753 and this would not be valid. However, Johann Keller was only ten years old when Schmidel's original Icones was published, and in the 1762 edition he accurately cited the Species Plantarum. Hence, though the 1762 edition was reprinted in 1793 as "Editio II," it was not a reprint of the earlier volume of 1747. This means that the generic name Proboscidea is valid, although the epithet Jussieui is invalid.

These generic situations were first set forth clearly by Van Eseltine in "A Preliminary Study of the Unicorn Plants (Martyniaceae)" (Technical Bulletin No. 149, N. Y. State Agr. Exp. Station, 1929). However, Van Eseltine should not have taken up Keller's invalid epithet Jussieui for the commonly grown unicorn plant. It is embarrassing to me to be guilty of having followed Van Eseltine in Hortus Second (1940) and the revised edition of Bailey's Manual of Cultivated Plants (1949), using the name Proboscidea Jussieui for the common unicorn plant. Had I at either time consulted Keller's volume of 1762, Van Eseltine's error would not have been perpetuated in these two reference works.

Following Keller, the next account of these plants was that by Philip Miller in the eighth edition of his Gardeners Dictionary (1768), where three species are treated under Martynia. M. annua L., M. perennis L. (=Gloxinia perennis (L.) Fritsch), and M. louisiana. On the last page of his Dictionary, Miller gave a list of corrections, and there changed the epithet "louisiana" to the etymologically correct spelling of "louisianica," since the species name was meant to commemorate the state of Louisiana, not Louis XIV, King of France. Miller's Martynia louisianica is the same plant Keller called Proboscidea Jussieui. Since the plant is properly a Proboscidea, the Swiss botanist Albert Thellung was correct in making the combination Proboscidea louisianica (Miller) Thellung, in 1912.

Proboscidea louisianica, according to Miller (1768), "... grows naturally in Louisiana, from whence the seeds were brought to France." It is an annual, grown easily from seed. The flowers of most garden strains are pale rose-purple, but in nature vary from dingy white to cream-colored and purple, always with a yellow throat. Those flowers that are whitish to cream-colored are also

blotched or flecked rose-purple, often dominantly so. All parts of the plant are covered with minute viscid glands, giving a clammy feel when handled. It is native from Indiana south to the Gulf and west to Colorado and New Mexico, and is naturalized along the Atlantic Coastal Plain as far north as Virginia and Delaware.

Two other species of Proboscidea are occasionally grown, P. fragrans and P. arenaria. When available, these are offered under the generic name Martynia.

Proboscidea fragrans (Lindley) Decaisne is a Mexican species which resembles P. louisianica but has violet- to red-purple flowers, often with deeper-colored blotches on the upper lobes and a bright yellow band extending from the lower inside of the tube out on the lower lobe. It is sometimes known as the sweet unicorn plant because of its pleasantly fragrant flowers. Unlike P. louisianica, whose mature leaf-blades are entire or very shallowly sinuate-margined, the mature leaf-blades of P. fragrans are usually markedly 5-lobed. Seed was last offered under this name by the Berlin Botanic Garden.

Proboscidea arenaria (Engelmann) Decaisne is a very different-appearing species, which ranges naturally from Texas west to Arizona and south into Mexico. It has yellow flowers, often striped or dotted in the throat with orange, brown, or purple. The leaf blades are 5-7-lobed, broader than long (mostly 3-6 cm. wide). The fruit-body is very slender, tapering slightly into the beak, and is about half as long as the beak.

Martynia

The removal from Linnæus' Martynia annua of the plants whose flowers have four stamens left as that species the element whose flowers have only two stamens. This is the true Martynia annua. It is the only species of the genus.

The name Martynia was given the plant by its discoverer, Dr. William Houstoun, a Scottish naval surgeon, in honor of his friend John Martyn, Professor of Botany at Cambridge. Houstoun found the plant about 1832 near Vera Cruz, Mexico, and sent seeds of it to Philip Miller at Chelsea. Perhaps it was through Miller that it came to Linnæus' attention when the latter was working at George Clifford's estate in Holland, for its name was first published by Linnæus in his Hortus Cliffortianus (1737), and was later validated in his Species Plantarum.

Martynia annua resembles members of the genus Proboscidea, but, though an annual, it grows to a height of 1-2 meters. The leaves are opposite throughout (the upper ones often alternate or subalternate in most other members of the family), 5-7-lobed, and 2-3 dm. across. The flowers are about 5 cm. long, in open ra-

cemes, varying from creamy-white to reddish-purple, usually dotted yellow, orange, or red within the tube, and with deeper-purplish blotches on the lobes. The calyx is composed of 5 separate lanceolate sepals, each about 1.2 cm. long. The fruit is smaller than in other species, the body being about 2.4 - 3.5 cm. long and the beak (or horns) about 1 cm. long.

The plant is native from highlands and coastal areas of northeastern Mexico, south through the highlands of much of Central America, and is also in the West Indies. It is said to be naturalized in parts of India and has been found in New Caledonia. Seed is offered under this name by the Danish Seed Co., 316 Hennepin Ave., Minneapolis, Minn.

The unicorn plants vary considerably in nature, and the seemingly isolated variants have been given many species names, largely under Martynia. The following enumeration may help to place those names considered synonyms of the cultivated species:

M. Craniolaria Gloxin = Craniolaria annua, but material so listed is probably Proboscidea louisianica.
M. fallax Kunze = P. fragrans
M. formosa Hort. = P. louisianica
M. fragrans Lindley = Proboscidea fragrans
P. louisiana Wooton & Standley = P. louisianica
M. lutea Lindley = Ibicella lutea
M. montevidensis Chamisso = Ibicella lutea
M. Proboscidea Gloxin = P. louisianica
M. violacea Engelmann = P. fragrans

While commonly called unicorn plants, these cultivated members of the Martyniaceae are also known variously as proboscis flower, devil's-claw, and elephant-tusk. The name common unicorn plant has frequently been used to distinguish Proboscidea louisianica from other cultivated species.

In the last thirty years more than 3,000 names have been published for African-violet cultivars. Experts agree that they cannot identify this many kinds, so slight are the differences. Registration records of the African Violet Society include no descriptive information about new cultivars whose names they register.

To provide some documentation of these plants, the Bailey Hortorium is growing as many of these as possible, about 200 kinds at a time. As each plant comes into flower it is photographed in color and in black and white, and an herbarium specimen is prepared of its flowers and foliage.

Plantsmen in Profile, III: Charles L. Tricker, Frank L. Skinner, Carl S. English, Jr.

Mary H. Moon
and
William J. Dress

Charles L. Tricker

Water lily and aquatic plant enthusiasts have known the name of Tricker for over sixty years. They first became acquainted with it when a water garden nursery was started in 1895 at Clifton, New Jersey, under the name of William Tricker and Co. Later, William Tricker's son, Charles, the only one of six children interested in plants, worked with him. He has continued to develop the firm since his father's death in 1916. Together they are responsible for providing, introducing, and originating a large number and variety of water lilies for the home water garden.

The elder Mr. Tricker was an English horticulturist and estate superintendent who came to Canada in 1880. In 1885 he moved to Staten Island, New York, where Charles was born in 1890. At just about that time Mr. Tricker became interested in water lilies, after seeing a beautiful display of them in a Newport, R.I., garden pool. For seven or eight years he experimented with their culture in pools and tubs, gaining the knowledge required to establish his own commercial nursery specializing in water lilies. The first Tricker catalogue (1895) offered "New and Rare Water-Lilies, Nelumbiums, and Other Choice Aquatics, Sub-Tropical Plants, Ornamental Grasses, Etc." In the introduction he described his satisfaction at the "great and rapidly growing interest in the cultivation of aquatic plants" in evidence at that time.

According to Bailey Hortorium records, Mr. Tricker's was probably the second American firm to specialize in water lilies and aquatics. E. D. Sturtevant had established such a nursery in 1876 at Bordentown, New Jersey, but transferred it to the West Coast in 1894. The first Sturtevant catalogues indicate that he offered a more limited range of aquatics, primarily Nymphæa and Nelumbo (water lilies and lotuses), than Mr. Tricker did.

Mr. Tricker sold his firm in 1897 to Henry A. Dreer, Inc., of Riverton, N.J., but continued to manage it as a department of Dreer's for the next eight or nine years. In 1906 he reestablished an aquatic nursery business of his own, this time at Arlington, N.J., continuing it until his death in 1916.

A number of the hardy and tropical water lily hybrids grown today were perfected by William Tricker: 'James Brydon', 'Dauben', 'Panama-Pacific', 'Pulcherrima' (now offered under the name 'Blue Beauty'), and 'Mrs. C. W. Ward'.

Soon after Charles Tricker took over the firm it became the introducer of all the hybrid water lilies originated by Mr. George H. Pring, Superintendent of the Missouri Botanical Garden and one of the world's leading hybridizers of these plants. Cultivars from France and England were also introduced to the American trade through the firm. Mr. Tricker commented in his catalogue of 1916 that the pressure of business did not leave him time to create water lily hybrids himself. He is still concerned with the firm primarily as a business operation, for he has told us that he has not originated any hybrids except in collaboration with his father.

The firm was transferred to its present Saddle River, New Jersey, location in 1926 and a year later the aquatic division of the Independence Nurseries, Independence, Ohio, was purchased and incorporated with it to provide new Midwestern markets. The Independence Nurseries started aquatics as a sideline in 1919 and added a department of goldfish breeding in 1924. Shortly after the merger, Mr. Tricker introduced the water lily originations of Mr. Robert V. Sawyer of the Independence Branch: the hardy 'Morning Glory' and 'Fire Crest', and the tropical 'Blue Bird', 'Rose Marie', 'Independence', and 'Janice'. The last two are viviparous or leaf-propagating kinds, and are reported to be respectively the first white- and the first pink-flowering lilies of this type. ('Rose Marie' and 'Janice' are no longer in the trade.) Later introductions from the Independence branch were 'Col. Lindberg', 'Alice Tricker', 'Patricia', and 'Cleveland'.

This year the firm has introduced two new yellow tropical water lily hybrids of Mr. Pring's origination, 'Aviator Pring' and 'St. Louis Gold'. Other Pring productions currently offered are the tropicals 'St. Louis', 'Missouri', 'Mrs. George H. Pring', 'Isabelle Pring', 'Bob Trickett', and 'Pink Platter', and the hardy 'Joanne Pring'. Practically all the tropical water lilies offered today are the result of breeding work by the Tricker firm or by George Pring.

Mr. Tricker currently offers a large variety of other aquatic plants, including lotus, oxygenating plants, floating, shallow water and bog plants, plus a short list of rock garden plants suitable for pool borders. Stock of the many different kinds listed is produced in the eleven greenhouses or 123 outdoor propagating ponds of the twenty-two acres at the two branches of the firm. These production areas are always open for visitors to enjoy. Twenty-five full-time and eight to ten part-time employees assist in propa-

Fig. 42. Charles L. Tricker.

gating Tricker's aquatic plants. The firm's market is primarily the United States and Canada, but Mr. Tricker estimates that, of his 35,000 customers, ten percent live outside this area.

Now sixty-seven years old, Charles Tricker has been in the commercial water gardening business for fifty years. Increasingly, he is transferring these activities to his son-in-law, Mr. Wilfred V. Schmidlin, at Saddle River, and to Mr. John T. Charleson at Independence, Ohio. He says that his ambition is "to keep an active interest in my business, to see more of this country, and to continue in my civic interests."

In Saddle River Mr. Tricker has been active on the Board of Health and in the Lutheran Church. His business associations include serving as director of the Savings and Loan Bank, of whose Board he is now chairman; as a director of the First National Bank of Allendale, N.J.; and as a member of the board of governors of the Valley Hospital at Ridgewood, N.J., where he serves as chairman of the landscape committee. In addition, Mr. Tricker is a Mason, and a member of the New York Florists' Club. At the top of his list of interests, however, is his hobby, gardening. He has developed the firm's catalogue into a handbook for planning, building, and stocking water garden pools - his major area of study and experimentation. In response to many requests, he lectures on water gardening before gardening groups throughout New Jersey.

M.H.M.

Frank L. Skinner

Early autumn frosts and long, frigid winters had discouraged the settlers of Manitoba, Canada, in the late 1800's, from growing any perennials and all but the hardiest annuals - portulacas, zinnias, and petunias. But Frank L. Skinner, a Scottish lad who accompanied his family to Winnipeg from Aberdeenshire in 1895, when he was thirteen, was determined to grow the perennials he had known and loved in Scotland's gardens. When he reached manhood, he purchased a variety of kinds from American and European firms and within a few years proved that Manitoba farm families had been pessimists. He found that a number of kinds of garden plants could survive Manitoba's rigorous winters. With this success came an interest in searching out plants that thrive in cold climates elsewhere, and that might prove hardy in his adopted home. Thus his career as plantsman began, and gardens in colder regions of Canada blossomed in expanding variety each summer.

Mock oranges, roses, and lilacs had been among his favorites in Scotland and at one time he imported a collection of 140 kinds of roses from Europe. A few survived a winter or two, but they, too, eventually died. Disappointed but not discouraged, he imported others, grafted some of them onto native hardy roses, and hybrid-

ized others with native species. In short, he tried every scheme he could devise to increase the hardiness of known garden varieties. Slowly he accumulated a garden full of various kinds of roses that had proved hardy in Manitoba.

The results of these patient labors are to be found today in double-flowered hardy roses with small leaflets, suitable for landscape plantings and for planting in beds. All have in their parentage either Rosa rugosa, R. laxa, R. spinosissima, or one of the native Canadian roses - the species he chose, about forty-five years ago, to use for hybridization from among the hardiest ones he had grown. Rose hybrids of his origination currently offered are: 'Haidee' (R. laxa × R. spinosissima); 'George Will' (R. acicularis × R. rugosa); 'Mrs. John McNab' (R. Beggeriana × R. rugosa); 'Wasagaming' and 'Will Alderman' (both with R. rugosa as seed parent); 'Beauty of Dropmore' (R. altaica × a variety of R. spinosissima); and 'Betty Bland' (with R. blanda as one parent).

Few books about plants pertinent to his interests were available to him in Manitoba in the early 1900's, other than the annual reports of the Canadian experiment farms. These Mr. Skinner read avidly, and learned that some northern Asiatic plants seemed hardy in test plantings in Canada. He purchased books on the Asiatic flora, and these became the core of his present botanical and horticultural library of over a thousand volumes. With the nearest public library still more than 200 miles from his present location at Dropmore in northern Manitoba, he has little choice but to obtain books of his own. Next to growing plants, reading about them brings him greatest enjoyment.

His work with Asiatic plants received its greatest impetus during a vacation trip to the Arnold Arboretum in 1918. Professor Sargent, then its Director, gave him a few seedlings of Syringa velutina and S. oblata var. dilatata that had been grown from seed collected by E. H. Wilson on the Diamond Mountains in central Korea a year earlier. These lilacs succeeded at Dropmore, where a collection of imported named European varieties had suffered from winter injury several years earlier.

Crossing Wilson's finds with S. vulgaris, he named several of the hybrids that resulted. Although he did not expect them to be of more than local worth, the plants he sent for comment to friends at the Morton Arboretum were so well received that he continued to work with lilacs. Today, the progeny he has selected from crosses involving the original S. oblata var. dilatata flower freely in many gardens in northern Canada where other lilacs are not ordinarily hardy. Many of his originations are dwarf forms which he recommends especially for planting near the modern bungalow-type dwellings. Hybrids having S. villosa as one parent and which are in his current list include: 'Hiawatha' and 'Donald Wyman'.

Climbing vines, fruit trees, perennials, and deciduous and evergreen ornamental trees and shrubs also came under his experienced hand. For thirty-eight years he has worked to produce hardier lilies, and for about twenty-three years to produce hardier chrysanthemums. One year he traveled from Alberta to Colorado searching for a hardy form of Douglas fir, which he finally found in Wyoming and Alberta. He found, also, that the Rocky Mountain form of Acer glabrum from Colorado and Wyoming was hardier at Dropmore than that which is native to southwestern Alberta. Another time, a severe winter proved that forms of Scots pine imported from northern Russia, Finland, and northern Sweden were hardier than the more common ones usually grown from commercially sold seed collected in Germany. Very few of the species of trees, shrubs, and flowering plants he has sought to introduce to Manitoban gardens are rare in cultivation. His contribution lies in locating, importing, testing, and making available strains of temperate and northern Asiatic plants that will prove hardy in areas where the winter temperature may drop to -50° F.

Until the post-World War I farming depression hit Canada, Mr. Skinner's activities remained an expensive hobby. He and his brother were then in partnership in a grain and cattle ranch at Dropmore. While riding herd, Frank Skinner studied the native flora, many species of which he selected to use in breeding work. The depression made it necessary either to abandon his plant introduction and breeding work, or to commercialize it and terminate his partnership in the ranch. On the advice of Professor William Alderman and Dr. M. B. Davis of Ottawa he chose the latter course. These men knew his nursery and the value of his work and were confident of his abilities. In 1924 he started a nursery later to be incorporated as Skinner's Nursery, Ltd. at Dropmore, with himself as president and general manager and his wife as vice-president.

Plants offered through the nursery are all tested and raised on fifty acres at Dropmore. Orchard and ornamental trees cover a major part of the area. Lilies are grown by the acre and other kinds of hardy perennials stretch across a number of fields. Two small greenhouses provide space for experimental work and for propagation. It is in these buildings that controlled crosses of poplars, willows, roses, and other groups of plants have been made through the years. Controlled pollination is also conducted out-of-doors by using isolated plants and removing all flowers but those being worked with. Mr. Skinner formerly protected all emasculated flowers with paper bags, but finds that for his purposes it is better to work with isolated plants.

Five full-time and ten part-time employees assist in producing the plants and in harvesting seed. Seed is offered when there are

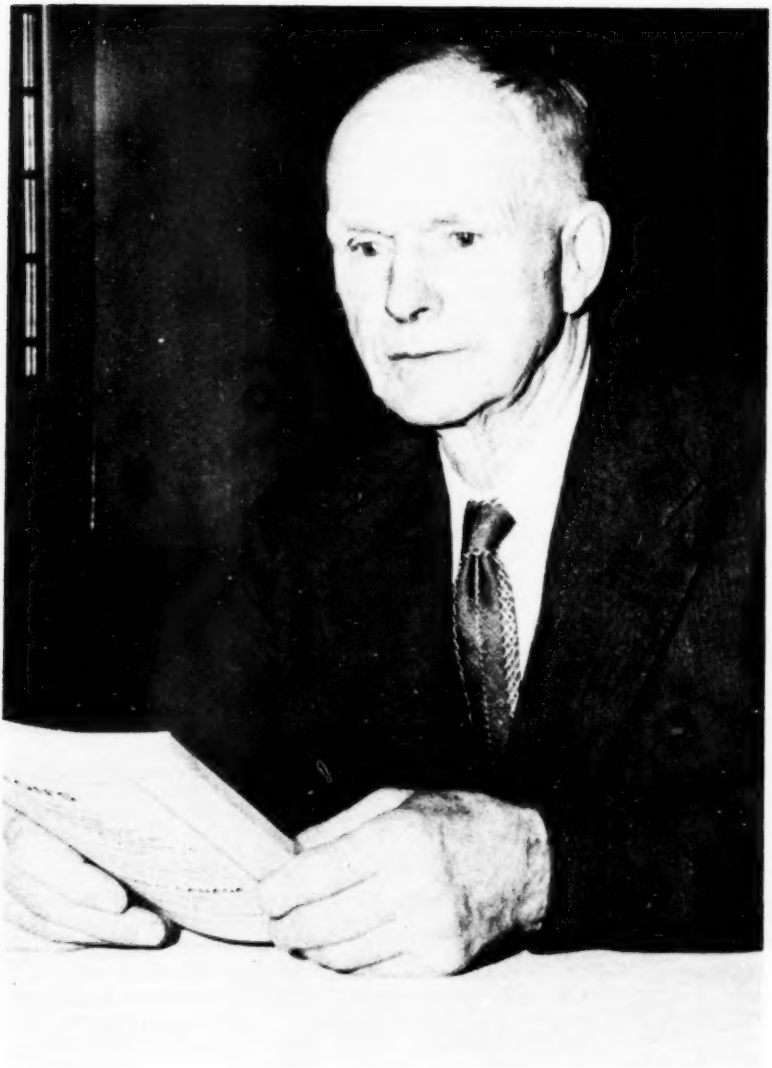


Fig. 43. Frank L. Skinner.

too few plant seedlings of a kind to list in the catalogues, of which nine thousand copies are currently printed and distributed to customers around the globe.

The number of genera in which Mr. Skinner has produced hardy hybrids or selected hardy strains is amazing: Anemone, Aster, Clematis, Cotoneaster, Crataegus, Dianthus, Hypericum, Iris, Larix, Lonicera, Lythrum, Malus, Paeonia, Philadelphus, Pinus, Populus, Primula, Prunus, Pyrus, Quercus, Ribes, Rubus, Salix, Spiraea, Tilia, Tulipa, and Verbascum. He has not kept complete records of the parentages of all his hybrids because his interest has been in the results. Last year, for example, he hybridized six species of willows hardy at Dropmore with three species of weeping willows obtained from the Morton Arboretum. Now he has about 1500 hybrid willows planted out, each having one of the three Morton willows as one parent. "You can imagine the amount of work it would take to accurately record the parentage of all these," he has commented. "Had I tried to do so, much of the work with plants would have been left undone."

Hybrids in lilies and chrysanthemums are among those of most widespread interest to gardeners throughout North America. Well-known lily hybrids are: 'The Duchess' (L. amabile × L. elegans var.); 'Evening Star' (L. concolor × L. elegans var.); 'Helen Carrol' and 'Orange Princess' (L. elegans × a Japanese var. of L. elegans); 'Glacier', 'Sunset Glow', and 'Juanita' (crosses of various selected hybrids of L. Hansonii × L. Martagon); and 'Redman' (L. medeoloides × a hybrid of L. Hansonii × L. Martagon). Chrysanthemums currently listed in the catalogue are all hybrids resulting from crossing C. Zawadskyi with various, now unknown parents: 'Daisy Mae', 'Deana Durbin', 'Dorothy Howard', 'Dr. Graham', 'Dr. Speechly', 'September Morne', 'Pygmy Pink'.

The 1957 introductions perfected at Dropmore include Spiraea 'Snowhite' (S. trichocarpa × S. trilobata); Rose 'Butterball' (Rosa altaica × R. spinosissima); 'Dropmore Scarlet' Trumpet Honeysuckle (Lonicera hirsuta × L. sempervirens), and Crabapple 'Rudolph' (parentage not recorded).

Plants selected for introduction next year include hybrid roses and spiraeas, and possibly a weeping poplar. Clematis and weeping willow hybrids, a number of herbaceous perennials, and Berberis altaica and B. sibirica are now under trial, and, if found reliable in the northern climate, will be introduced later.

Willows and poplars are Mr. Skinner's major interest at present. During a trip to Scandinavia in 1947, he became acquainted with work done in Denmark in producing rooted cuttings from hybrids between Populus tremula and P. tremuloides, and successfully introduced P. tremula 'Erecta' (budded on P. tremuloides) from Norway to Manitoba. He has not yet succeeded in getting

P. tremula 'Erecta' established on its own roots, a step he considers essential before it will be satisfactory for general planting.

Among the difficulties that have beset Mr. Skinner, in his efforts to provide Canadians with hardy plants, have been a drought that destroyed his promising rhododendron collection; insect and disease damage to the plants he wished to work with, which delayed his breeding program; and difficulties in locating correspondents who could supply particular plants. There have also been problems in importing certain plants, in obtaining labor, especially since World War II, and in securing capital for his undertaking. Finally, there are the restrictions imposed by the northern Manitoba climate itself. Mr. Skinner's nursery is one of the northernmost outposts in North America originating and supplying ornamental plant material suited to the colder-climate garden.

Now seventy-five years old, Mr. Skinner continues his nursery with the expectation that his two young sons, Frank Leith, Jr., eight, and Hugh William, six, may one day carry on the work. It has been a happy experience for him to watch northern Canadian gardens blossom with trees and flowers from Dropmore, but perhaps more satisfying has been the acceptance of many of his hybrids in gardens where tolerance of a temperature of -50° F. is not a requirement for their selection. Above all, Mr. Skinner is conscious of the work yet to be done to make available desirable Asiatic plants that might prove hardy in Canada, and to provide strains and hybrids of many warmer-climate plants that Canadians would like to add to their gardens.

M.H.M.

Carl S. English, Jr.

Outside the weathered cedar gate that opens to the home and garden of the Carl Englishes stands a slender little white-barked tree with small gray-green leaves, and, in season, triads of modest little flowers consisting mostly of yellow stamens. The knowledgeable visitor who recognizes it as a eucalyptus[1], thriving in Seattle, Washington, far north of its larger relatives so common in California, and even farther from its native Australia, may at once anticipate the rich store of horticultural rarities gathered together beyond the gate. For Carl English, though a botanist, horticulturist, and nurseryman, is first of all a dedicated "dirt-gardener." His seed and nursery business is an outgrowth of his enthusiasm for searching out the lovely and rare natives of the mountains and forests of the Northwest, and of his keen enjoyment in growing these and choice exotics for his own pleasure.

As with many other horticulturists, both amateur and professional, this interest in plants developed while Carl was still a boy, an interest perhaps awakened and stimulated by the many house-

[1] Eucalyptus Gunnii, perhaps the hardiest species of the genus.

plants and garden flowers which flourished under his mother's care on the family farm near Camas, Washington. When only 16 years old, he built a 16 by 50 foot greenhouse with his own funds, and with only a little additional help. A freshman course in botany in high school inspired him to specialize later in that subject in college, and so, when he graduated in 1929 from the State College of Washington at Pullman, it was with a B.A. degree in botany. His work in that field, however, had been supplemented by considerable work in ornamental horticulture and landscape-architecture.

It was while at college that Carl English met the girl who was later to become his wife. Working one day in the herbarium, he became acquainted with fellow-student Edith Hardin, who, though majoring in zoology, was equally interested in botany. Both were students of Dr. Harold St. John (now at the University of Hawaii), who, as a teacher, was so able to communicate to his students his own enthusiasm for systematic botany that Mr. and Mrs. English have faithfully maintained a very active interest in the taxonomic and nomenclatural problems of the plants which are so much a part of their lives.

Following his graduation from college, the Englishes settled in Portland, Oregon, where Mr. English did landscape work for the Swiss Floral Company, owned by J. G. Bacher. Right from the start, however, the Englishes established a small spare-time seed and plant business, dealing entirely in natives of the Pacific Northwest. Their first list, sent out in 1930, offered well over a hundred species of plants and about the same number of kinds of seeds.

In 1931 the Englishes took up residence in Seattle, where Mr. English is Horticulturist (a civilian position) with the Corps of U.S. Engineers at the Government Locks park. This is the position from which he actually earns his livelihood, for the seed and plant business is still a spare-time enterprise, though it has grown considerably in volume and earnings, as well as in the variety of plant materials offered, since it was begun in 1929. At present, about 1500 kinds of plants and about 1000 kinds of seeds are available from him.

Though having no connection with Mr. English's private business, the public park at the Government Locks reflects very strongly his wide knowledge of plant materials. Under his supervision, and with his many personal contributions of seeds and plants, the park has become a botanical garden in miniature, for the informally planted beds and borders embrace an extensive collection of plants, chiefly of outstanding trees and shrubs from all over the world. Nearly all of these have been grown from seed obtained through exchange with botanic gardens throughout the world.

Ornamentals seldom otherwise encountered so far north, but thriving at the park, are a dwarf palm (Chamaerops humilis), the windmill palm (Trachycarpus Fortunei), Fremontia californica, Trochodendron aralioides, Embothrium coccineum, and Eucryphia glutinosa.

Fig. 44. Carl S. English, Jr.

The home nursery itself is, for the most part, at the rear of the Englishes' own garden on the one-acre plot christened "Dogwood Dell" by Mrs. English. This was originally a bit of rich woodland on irregular ground. That corner of the lot farthest from the house has been kept nearly in its original state, with its large maples, dogwoods, and hemlocks, and natural growth of Gaultheria Shallon and Holodiscus discolor. This natural vegetation grades into plantings of rhododendrons and other shrubs, with their under-plantings of native woodland herbs. Beyond these, on the other side of the lawn and in the high-shade of trees and shrubs edging the drive, are the carefully prepared sloping beds of acid humus in which have been set all the smaller plant-treasures, native and exotic, which are Carl English's particular delight. Here, thriving among mosses and logs, are many small ferns, including a tiny dwarf form of the maidenhair (Adiantum pedatum) which came originally from the coast of the Olympic Peninsula; a number of dainty star-flowered native members of the saxifrage family -- species of Tellima, Tiarella, Mitella, Tolmiea, Bensonia, Boykinea, Heuchera; many dwarf ericaceous shrublets such as Epigaea asiatica, Leucothoe Davisiae, Tripetaleia bracteata, Orphanidesia gaultherioides, Menziesia lasiophylla, several kinds of Gaultheria, etc.; and various members of the genera Dodecatheon, Soldanella, Primula, Synthyris, Shortia, Schizocodon, Ramonda, Coptis, Cypripedium, and many other small choice things. Although this represents the Englishes' personal garden, the plants in it often furnish propagating material for the nursery, and their seeds are carefully gathered to swell the list offered to other gardeners.

Hidden from the rest of the garden by flowering shrubs are the small experimental beds where Edith English carries on her hybridizing, especially with native irises. Here she produced the lovely yellow Iris × aureonympha 'Golden Nymph', by hybridizing the West Coast natives, I. Douglasiana and I. innominata. This hybrid won for her, in 1950, the National Horticultural Achievement Award given by the Federated Garden Clubs of America.

Behind the house and garden the land drops sharply to form the western slope of a lightly-wooded ravine; the upper part of this slope has been terraced to accommodate the numerous flats and pots of young trees, shrubs, and perennials which comprise the nursery. A small greenhouse nearby is used by Carl for propagating his plants - and by Edith for raising frogs! These are not ordinary frogs, of course, but are the entirely aquatic African Xenopus laevis, the females of which have been found to be so useful in clinical tests for pregnancy. Edith is able to supply quite a number of them to local hospitals, and is glad to do so, since, unlike some other animals also used in such tests, the frogs are not harmed in the process and, at intervals, may be used again and again.

In addition to the seeds which are collected in their garden, the seeds of many Northwestern natives are collected by the Englishes in the wild. In fact, in his own words, it was his "intense and inherent love of plant life and the enjoyment of plant exploration, especially in the high mountains," that prompted Mr. English to enter the nursery business in the first place. By carefully combining holidays and week ends with his annual leave from work at the park, the Englishes have, over the years, explored and botanized in many of the mountain ranges of the western states. Their favorite areas are the Cascades, the Olympics, the Wenatchee Mountains, the Blue Mountains, the Siskiyous, Mt. Baker, and Mt. Hood, although they have ranged even farther afield. This past summer, for instance, their botanical exploring took them to Montana, Wyoming, Idaho, and a corner of Oregon. A year ago, several high ranges in Utah and Nevada claimed their attention.

The number of previously rare or unobtainable species of native plants which these trips have made available to the horticultural world is legion, and includes trees, shrubs, and herbaceous plants. To list them would take several pages of this publication. Seeds especially are collected in quantity, but plants also are frequently taken. The Englishes "strongly disapprove of supplying plants directly from the wild, and will not do so." In their explorations they select outstanding individuals among the native species and then propagate these at home. Though it sometimes requires many years to develop sufficient stock to put a particular plant on the market, they count this time well-spent, their aim being quality, not quantity. Some selected forms of native plants have seemed so outstanding that they have been given cultivar names by the Englishes: Synthyris reniformis 'Regina', Dodecatheon pauciflorum 'Red Wings', Iris Douglasiana 'Pegasus' and 'Chamois'.

Two lovely little plants of the purslane family (Portulacaceae), now to be found in the gardens of alpine-plant specialists, were originally discovered, named, and published by Carl English: Talinum okanoganense from the Okanogan Highlands of north-central Washington; and Claytonia nivalis from the Wenatchee Mountains of central Washington. In addition he has produced at least two horticulturally worthy hybrids of native mountain-dwellers: Penstemon × Edithiae (P. Barrettae × P. rupicola); and a Lewisia hybrid (L. Howellii × L. rupicola).

At home, Carl and Edith "conduct what might be termed perpetual open-house, horticulturally speaking." During the fall, winter, and spring months classes in either horticulture or botany meet there once a week. Garden-club members frequently come to get material for programs they are to present. The Englishes' library of horticultural and botanical books is always available to them to use - the only rule being that the books must be used there. During the summer months they "have had the pleasure of welcom-

ing many botanists and horticulturists and have taken most of them on field trips to the mountains to help locate the plants they wished to study."

Both Carl and Edith English also give illustrated lectures outside their home, to garden clubs, schools, nature organizations, and similar groups, and have written many horticultural and botanical articles. For both lectures and articles, as well as the classes taught at their home, Mrs. English takes many black-and-white photographs and colored slides, for another of her hobbies and accomplishments is photography. (In addition, her part of the family activities includes composing and editing the catalogues, keeping the accounts, and pressing and mounting plants for their own private herbarium and for other herbaria.)

Both are active in the Northwestern Unit of the American Rock Garden Society, which Carl served as president for three years. In the Seattle Unit of the Men's Garden Club of America, he was last year program chairman, and is now president. In such an active life, it hardly seems possible that much opportunity would be afforded for moments of relaxation, but Carl says, "As occasional diversion from too concentrated a botanical diet, I enjoy good music and like to read, especially in the field of astronomy."

Many a horticulturist will agree, I think, that Carl and Edith English have indeed found the full life!

W.J.D.

The Bailey Hortorium has been awarded a grant of $59,650 by the Longwood Foundation to produce an annotated international checklist of Camellia cultivar names, and to provide documentation of every cultivar available. It will be a five-year project. Mr. Ralph N. Philbrick of Los Angeles will be in charge.

In 1955 the Bailey Hortorium was asked to determine what American society should be invited to act as the International Registrar for Camellias. It quickly became apparent that the confusion in Camellia names, and in the identification of the cultivars, was so great that no society felt it could favorably consider such an invitation. This prompted the Bailey Hortorium to investigate the project.

For a century and longer there has been an abundant exchange of Camellia cultivars between the Orient, Europe, and America. Any effort to clarify the problem in one country must take all into consideration. Hence, Mr. Philbrick's studies will take him to classical or significant living collections in this country, Europe, and Japan. The number of extant cultivars is unknown, but the number of names to be treated exceeds ten thousand.

Book Review

"Tropical Plants and Their Cultivation" by L. Bruggeman (translated from the Dutch). 228 pp., with 292 illustrations in color by Ojong Soerjadi. Introduction and additional notes by W. M. Campbell. Thames and Hudson, London. 1957. Price: 3 pounds, 3 shillings ($8.82).

This is a very attractive book, judged by its physical characteristics and the design and organization of its contents. The sunny quality of the foliage abstraction in white, light blue, green, and yellow on the cover is continued in the yellow end-papers. The large (9 1/4 x 7 in.) pages are of a pleasant whiteness, texture, and substance, the margins broad, the type large and readable, the paragraphs spaced. The numerous colored illustrations, usually four to a page, are disposed in several groups throughout the book. Evidently reproductions of watercolors, they are sensitive and artistic individual portraits of most of the plants described in the text. They are botanically accurate, also, though the definition is sometimes too soft and the colors are muted (at times almost to the point of muddiness, and sometimes not quite faithful in tone to those of the living plants).

As for the text, there are ten chapter-like divisions grouping the plants variously according to natural relationships, habit, or uses: e.g., Ferns and Fern-like Plants; Climbing and Twining Shrubs and Herbs; Annuals; Coniferae; Bamboos; Trees; Shrubs; etc. A brief general note introduces each group, and is followed by an alphabetical listing of the included genera and species, each with a short paragraph of description and comment, and with a marginal notation of the number of the plate illustrating it, if any.

Unfortunately, the admiration and anticipation one feels upon first glancing through this book is somewhat dispelled by a feeling of bewildered irritation after having read the test critically. For, here, essentially, is a horticultural mish-mash, still in search of an appropriate title and of a good raison d'être.

The title of the book is somewhat misleading - Lathyrus odoratus, Tradescantia virginiana, Platycodon grandiflorum, Helianthus annuus, Achillea Millefolium and A. Ptarmica, Viola odorata, Aster incisus ("Handsome plant from Siberia"[!]), Acer japonicum, Sambucus canadensis, and a host of other species included here

are certainly not tropical plants. Whether they are often to be found cultivated in the tropics or whether all would even grow for long under tropical conditions is questionable.

In his introduction to the book, Mr. Campbell (Curator, Royal Botanic Gardens, Kew) says, "[Since] not only are exotic and tropical plants portrayed but also many that are hardy or half-hardy in this country [England] ... it is evident that the book must prove interesting to all garden lovers ..." Such a deduction is not evident to me. It is reminiscent of the reasoning behind the frenetic "variety" radio programs which cram into a half-hour a little classical music, a few popular song-hits, a bit of "hot" jazz, winding up with a hymn, in order to appeal to "every member in the family." One may hear such a program, but one seldom listens to much of it. Rather than these cold-climate plants, many more really tropical plants could and should have been included. Of the palms, for instance, (estimated here as a family of about 1200 species), only 15 are mentioned, and of the ferns, only 17. Yet, many, many species of these plants are important horticulturally in the tropics.

Nowhere in the book are the terms "tropical" or "tropics" defined, yet the account for nearly every species of plant includes a recommendation that it be grown above or below a certain altitude. Considering what differences in latitude, geography, and therefore climatic conditions exist within the "tropics," and what these differences mean in terms of growing conditions, it seems brash to make such specific recommendations for such undefined conditions.

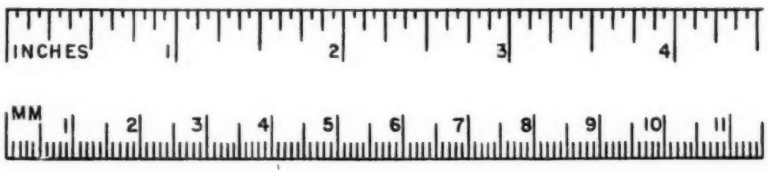
The "... and Their Cultivation" part of the title is represented by rather sketchy, if any, notes in Mr. Bruggeman's own text (apart from the altitudinal recommendations). Mostly, the cultural notes are those, appended to Bruggeman's description of each species, by Mr. Campbell, and they concern the plant's culture in England, usually under greenhouse conditions.

In several instances which caught my eye, a bit of revision or editing would be appropriate. Although most of the scientific names seem to have been carefully checked, a few used are antiquated, notably among the palms. At least half of the latter are now correctly known by other names. Euphorbia splendens should be E. Milii; the Chrysanthemum indicum mentioned ought to be referred to as C. morifolium (and I have yet to see "blue flowers" on a form of this). Plate 116 depicts Hemerocallis fulva, not H. flava; plate 244 shows Hibiscus schizopetalus or a hybrid of it, not H. Rosa-sinensis; plate 10, Clitoria ternatea, is upside-down. Nopalea coccinellifera may be propagated by stem-cuttings, rather than leaf-cuttings. Of the tree, Pisonia alba, the curious statement is made: "The tree seldom or never flowers and the fruits are unknown ... Propagated by seed" [!].

W.J.D.

ABBREVIATIONS USED IN BAILEYA

ann.	annual	dm.	decimeter	lf.	leaf
bien.	biennial	fl.	flower	lft.	leaflet
br.	branch	fls.	flowers	lvs.	leaves
brt.	branchlet	flt.	floret	mm.	millimeter
caps.	capsule	fr.	fruit	per.	perennial
cl.	clone	ft.	foot	segm.	segment
cm.	centimeter	hort.	horticultural	st.	stem
cv.	cultivar	in.	inch	sts.	stems
diam.	diameter	infl.	inflorescence	var.	variety

METRIC - ENGLISH EQUIVALENTS (approximate)

6 mm. - 1/4 in.	10 cm. - 4 in.	10 mm. - 1 cm.
12 mm. - 1/2 in.	1 dm. - 4 in.	10 cm. - 1 dm.
25 mm. - 1 in.	3 dm. - 1 ft.	10 dm. - 1 meter
2.5 cm. - 1 in.	10 dm. - 1 yd.	
5 cm. - 2 in.	1 m. - 39 in.